

## Method For Constructing a Process-Driven System

The present invention relates to a method for constructing a process-driven information system, and more particularly to a method for the development of business process models for distribution through web browsers, and the provision of access to diverse information sources and system functionality through said models.

The development and distribution of process models is increasingly valued as the focus for many business improvement endeavours, ensuring that business workers appreciate how their part of the business works and how their contribution relates to other parts of the business. The value of process models can come both from enhanced business performance, and from the reduction in risk of failures of adherence to best practise, whether that best practise is defined within the organisation or by a regulatory body.

Realising the potential value of process models requires the dissemination of models which fulfil the following requirements:

- 1) Can reflect various aspects of the business processes; and
- 2) Which actively support the business workers in carrying out their work.

As an example of the first requirement, a product delivery process is likely to require co-ordination between technical, financial, logistical and marketing responsibilities; and an individual financial analyst needs to be able to identify the tasks currently required of them, and to appreciate the context of their analysis, including the likely consequences of their judgements or recommendations.

As an example of the second requirement, said product delivery process is likely to require computer support which is integrated with the various coordinated responsibilities, and available to a financial analyst within the context of these responsibilities.

Inventions in the field of process modelling have attempted to address the first of these requirements e.g. by providing graphical representations of processes [US5819270], or mapping processes to workflow structures [U\$5630069], and this work is cited here as prior art. These inventions provide a visualisation of business processes in the context of business intent and direction. A number of prior approaches exist to disseminate business models widely across a business, typically comprising business modelling software combined with a facility to generate a set of web based pages representing these models, navigable by business workers. However these approaches do not provide for the enactment of processes i.e. the manipulation of resources by workers which are required to put the business steps which are the subject of the models into practice.

Inventions in the field of process enactment and workflow have attempted to address the second of these requirements, through:

- A. Methods and apparatus for developing workflow systems to support ordered activities carried out by a collection of users and examples of this are disclosed in the prior art patents US05799297, US05216592, US05301320, US0574661.
- B Systems to address the task needs of users independently of their co-workers and an example of this is disclosed in US0553861

These documents illustrate systems to provide support for the manipulation of business resources by workers, but typically lack

visualisation, contextual positioning and awareness for workers within the processes of a business.

There have been previous attempts to bring these two areas of business process modelling and understanding, and resource manipulation, together using workflow systems to address specialist functional requirements such as illustrated in US05745901 or using specific modelling languages of tasks and actions as illustrated in US05734837, so concentrating only on processes which are to have an enactment through computer support. The call centre is a typical embodiment of such a concept. Products which attempt a more general linking of these two areas have used proprietary technologies to do so.

It is therefore an aim of the present invention to provide a general, open method for a process model, which addresses both of the requirements illustrated above and to allow the potential value of the business modelling as outlined in the above to be realised.

According to the present invention there is provided a method for creating a process-driven information system, said method comprising the following steps:

- creating a process model of a system comprising one or more elements, said model created in a browser-compatible format
- using this model to identify the requirements for software support
- creating one or more software components in a browser-compatible format satisfying these requirements
- generating a process-driven information system comprising said one or more elements of said process model acting as the user interface to said software components

Typically the process model is part of a general purpose graphical business model.

In one embodiment the software components are accessed by the user selection of one or more of the process model elements. Typically the process model is illustrated on a display screen and the elements can be selected by any conventional user control system such as mouse, keyboard etc. and when an element is selected an appropriate display is generated for any associated software component.

Further preferably the process model is accessible via a web browser.

Typically the one or more elements of the process model are provided in a tool which uniquely identifies each element and maps each element to one or more software components, in one example, in the form of arbitrary alternative web pages and/or web-based resources.

In use, a modeller/user follows the method described above to create a set of general purpose graphical business models containing various linked elements in a tool, said tool able to generate models which are accessible by a web browser and which links the model elements in the browser by uniquely identifying each element and corresponding web page. A preferred embodiment of the invention allows the modeller to preview the web page of a model element, and map this model element to an arbitrary alternative web-based resource.

In addition, a preferred embodiment of the present invention implements the concept of user-driven information system development utilising open standards in process modelling and

software component development based on web browser technologies.

The advantage of the present invention is that it provides a method for creating a process driven information system which can communicate and disseminate arbitrary business intent, additionally providing the task support characteristics of workflow software, typified by its ability to provide coordination and awareness support for business users carrying out their work within the organisation. The method allows non-technical users to rapidly create process models which describe the working of an organisation. The models can be used as the user interface for directing the operation of a collection of software components.

Embodiments of the invention will now be described with reference to the accompanying Figures wherein:

Figure 1 represents an embodiment of the architecture of the apparatus of the present invention;

Figure 2 shows a screen display of a 'Care Planning and Delivery Process';

Figure 3 shows a screen display of the 'Care Planning and Delivery Process' utilising a process model in accordance with the invention, allowing a preview of the web-based model generated from the business modelling software;

Figure 4 shows a screen display allowing the searching of a patient database;

Figure 5 shows a screen display of the drag-and-drop of the web-based form from Figure 4 onto the model element 'Find a Patient' in accordance with the invention;

Figure 6 shows a screen display of the electronic form from Figure 4 mapped to the model element 'Find a Patient' in accordance with the invention;

Figure 7 shows a screen display of the mapping between the electronic form from Figure 4 and the model element 'Find a Patient';

Figure 8 shows a screen display of the published model 'Care Planning and Delivery' in accordance with the invention;

Figure 9 shows a screen display of the published form, navigated to from the model element 'Find a Patient', and parameterised by the user;

Figure 10 shows a screen display of the results returned from the populated form.

*TM* *M* The models for this example were generated using a process modelling tool, "MooD Business Developer", and Mood Web Publisher, TM MooD and the screen display of the web-based form was developed in "Microsoft Visual InterDev" TM Microsoft. It should however be appreciated that other alternative products could be used to perform the same functions.

In the following description, an example of the method according to the invention is referred to as "PSIM" (Process-Systems Integration Method). The underlying concept of PSIM is to harmonise the enactment of business processes with the delivery of associated

computer support by linking graphical maps of arbitrary business processes to software resources used in the support of those processes, presenting a consistent operating interface for all users. A preferred embodiment of PSIM is shown in Figure 1 and is as follows:

1. A modelling team creates a set of process models 2 representing the business to be modelled and a tool 4 which generates browser-compatible outputs is used, also noting the software behaviour (e.g. information access and information recording) required to support each process.
2. A development team creates a set of browser-compatible resources (e.g. software components or documents) 6 based on the requirements determined in step 1.
3. The modelling and/or development team creates a mapping between model elements and software components such as documents or databases in accordance with the invention 8, which stores the mappings and modifies the collection of web pages appropriately.
4. The resulting PSIM system 10 is published to the user community 12.
5. The above 4 steps are typically periodically repeated in a review cycle in which the process models and resources of the PSIM system 10 are revised and re-published.

An example which illustrates the first four steps of the above preferred embodiment is as follows:

A process model is required to be developed for a healthcare process:

*Sub 1* 1. A team of healthcare experts defines a set of care pathways with a model of patient care 12 using a business modelling tool 14; and the models are published in HTML format using the tool "MooD Web Publisher", which uses the unique identifier of each process as the basis for the process's URL. An example is the model of 'Care Planning and Delivery' as shown in Figure 2.

*Sub 2* 2. A team of software developers develops a set of browser-based software component applications to implement the behaviour required by the processes developed in step one. Figure 4 depicts an example of a 'Find Patient' Form 16 which can be used to list all patients recorded in a particular database matching a certain surname.

3. Figure 3 depicts a software tool in accordance with the invention, which represents the web-generated business models in a hierarchy form, and previews the web-pages generated from these as described in step 1. This tool allows the user to map arbitrary files to model elements as depicted in the hierarchy. Figure 5 depicts the dragging of an HTML form developed in step 2 onto a model element in the hierarchy. Figure 6 depicts the user choosing to map this form onto the model element. The tool sets up the mapping in a database, in this case using the database utilised by the business modelling tool, and replaces the appropriate pages in the published set of pages. Figure 7 illustrates how the mapping appears in the modelling tool.

4. The system is published in the form of a web-site, with web pages for process models interleaved with active pages providing access to appropriate software behaviour. Figure 8 gives an illustration of the

'Care Planning and Delivery Process' as it appears running in a browser for use by users of the system.

Figure 9 illustrates the result of a user selecting a model element 'Find a Patient' depicted in Figure 8 and typing in some text to the text field. Figure 10 depicts the result of the user selecting the 'Find' button on the form depicted in Figure 9.

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